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BEVER, HOFFMAN & HARMS, LLP
2099 GATEWAY PLACE
SUITE 320
SAN JOSE, CA 95110

EXAMINER	
PATEL, SHAMBHAVI K	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,058	KUCUKCAKAR ET AL.	
	Examiner	Art Unit	
	Shambhavi Patel	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,11-30,32-43 and 45-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9, 11-30, 32-43 and 45-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A **request for continued examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **13 September 2007** has been entered.

2. Claims 1-9, 11-30, 32-43 and 45-82 have been presented for examination. Claims 45-82 are newly added.

Response to Arguments

3. Applicant's arguments with respect to claims 1-9, 11-30, 32-43 and 45-82 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. **Claims 20-24 and 79-80 are rejected under 35 U.S.C. 101** because the claimed invention is directed to non-statutory subject matter. The Examiner asserts that the current state of the claim language is such that a reasonable interpretation of the claims would not result in any useful, concrete or tangible product. **Independent claims 20 and 79-80** are directed to reports resulting from static timing analysis. This claimed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful, concrete and tangible result. Specifically, the claimed subject matter does not produce a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulated data.

More specifically, the claimed subject matter provides for a report. This produced result remains in the abstract and, thus, fails to achieve the required status of having real world value. All other claims are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

07 5. **Claim ~~81-82~~ 79-80 are rejected under 35 U.S.C. 102(e)** as being clearly anticipated by **Schultz (US Pub. No. 2004/0044976).**

Regarding claim 79:

Schultz discloses a report generated by static timing analysis, the report comprising a set of automatically merged results **([0045])** generated by a plurality of static timing analysis runs **(figure 1: 204),** wherein the merged results provide path information at multiple levels of detail **([0040]; [0045])** and user-selected accessibility to the results **([0040]; [0046]),** the results being organized based on at least one of modes and corners **([0045]).**

Regarding claim 80:

Schultz discloses a report generated by static timing analysis, the report comprising a set of automatically merged results **([0045])** generated by a plurality of static timing analysis runs **(figure 1: 204),** wherein the merged results provide analysis coverage **([0029])**, the results being organized based on

at least one of modes and corners **([0028])**, and the analysis coverage including reporting parts of a design that are analyzed for each mode and corner **(figures 7A-7D: lists nodes)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 1-9, 11-30, 32-43, 45-78 and 81-82 are rejected under 35 U.S.C. 103(a)** as being unpatentable over **Schulz ('Focus Report: Timing Analysis'** 2000**) in view of Schultz (US Pub. No. 2004/0044976).**

Regarding claims 1, 20, 25, 45, 62, 81:

Schulz discloses a method of performing static timing analysis on a design, the method comprising:

a. performing multiple static timing analysis runs with the design, each run using a predetermined set of parameters including a mode and corner **('A Look Under the Hood' 5th paragraph).** The prior art discloses tools that are capable of performing minimum/maximum delay analysis (i.e. multiple runs are needed, one to account for the minimum delay and a second to account for the maximum delay) and modal analysis.

b. saving results from the multiple static timing analysis runs **('A Look Under the Hood', 2nd paragraph).** Once the runs are completed, the data is collected and presented to the user in reports and various visualization tools.

Regarding **claim 20,** Schulz further discloses producing a report from the saved results **('A Look Under the Hood', 2nd paragraph).**

Regarding **claims 25 and 81,** Schulz further discloses software tools containing instructions to perform the above steps **(Introduction).**

Schulz does not explicitly disclose merging the results. **Schultz teaches** merging the results to provide analysis coverage **(Schultz: [0029])**, path information at multiple levels of detail **(Schultz: [0026])**, and user-selected accessibility to the results **(Schultz: [0047]-[0048])**, the results being organized based on at least one of modes and corners **(Schultz: [0028])**. At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Schulz and Schultz in order to minimize the number of probe pointes necessary to isolate a failure and eliminate manual tracking of schematic and waveforms during root cause debugging **(Schultz: [0011]).**

Regarding **claim 62, Schultz teaches** reporting parts of the design that are analyzed for each mode and corner **(Schultz: figures 7A-7D: nodes listed).**

Regarding claims 2, 46, 63:

Schulz discloses the method of claim 1, wherein the multiple static timing analysis runs are independent **('A Look Under the Hood' 5th paragraph).** The prior art discloses tools that are capable of performing minimum/maximum delay analysis (i.e. multiple runs are needed, one to account for the minimum delay and a second to account for the maximum delay). Since the runs account for two different delays, they cannot share information and are thus independent.

Regarding claims 3, 47, 64:

Schulz discloses the method of claim 1, wherein the multiple static timing analysis runs share information **('A Look Under the Hood' 1st-2nd paragraphs).** The tool parses the netlist, maps it into a target library, and creates a list of paths. This list is then shared amongst the runs as they prune the paths according to their criteria, and then compute values for the cells and interconnects incorporating timing or parasitic data.

Regarding claims 4, 48, 65:

Schulz discloses performing the multiple static timing analysis runs in parallel **('Putting Timing Analysis Tools to Work' 7th paragraph).** The prior art discloses single-pass analysis of best/worst case conditions in order to minimize cycle time.

Regarding clams 5, 49, 66:

Schulz discloses performing the multiple static timing analysis runs in series **('More Bells and Whistles' 2nd paragraph).** The prior-art discloses what-if analysis, which allows for on-the-fly variations (i.e. multiple runs in series).

Regarding claims 6, 50 and 67:

Schulz discloses forming a database that can be queried at different levels of detail **(2nd paragraph; 'Putting Timing Analysis Tools to Work' 9th-10th paragraphs).** The user can obtain exhaustive timing analysis reports, reports that emphasize trouble areas, or waveform models of selected critical paths.

Regarding claims 7, 51 and 68:

Schulz discloses restoring (i.e. reading) the database and making additional queries **('A Look Under the Hood' 2nd paragraph).** The reports and visualization tools can provide results sorted according to the user preferences (i.e. the user can query the database to access desired information).

Regarding claims 8, 52 and 69:

Schulz discloses querying from one or more runs **('A Look Under the Hood' 2nd paragraph).** After the timing verifier engine calculates slack and constraint violations (two separate runs), the results of both runs are presented to the user.

Regarding claims 9, 53 and 70:

Schulz discloses adding additional results to the saved results of each run during each query **('More Bells and Whistles' 2nd paragraph).**

Regarding claim 11, 54 and 71:

Schulz discloses the method of claim 1, wherein the predetermined set of parameters include a plurality of modes and corners **('A Look Under the Hood' 5th paragraph)**, wherein the multiple static

timing analysis runs share information, and wherein the plurality of modes and corners are automatically analyzed to determine shared information between parallel runs **('A Look Under the Hood' 1st-2nd paragraphs).** The tool parses the netlist, maps it into a target library, and creates a list of paths. This list is then shared amongst the runs as they prune the paths according to their criteria, and then compute values for the cells and interconnects incorporating timing or parasitic data.

Regarding claims 12-13, 39-40, 55-56, 72-73:

Schulz discloses saving results include a predetermined set of parameters that are used in creating additional results **('A Look Under the Hood' 4th paragraph).** Schulz discloses the features of generic static timing analysis tools, which teach the limitations of the parent claim(s). The prior art further discloses features of a specific tool, SST Velocity, which can automatically identify clock domains (parameters). The generic timing tools and the specific timing tools disclosed by Schulz are analogous art (static timing analysis tools), and it would have been obvious to one of ordinary skill in the art to combine the multiple teachings of Schulz because automatically identifying clock domains eliminates false paths so that the remaining synchronous logic can be properly analyzed **('A Look Under the Hood' 4th paragraph).**

Regarding claims 14, 57, 74:

Schulz discloses the method of claim 1, wherein the saved results include results of predetermined queries **('A Look Under the Hood' 2nd paragraph).** If the engine calculates slack and constraints violations, the reports containing this data are then presented to the user.

Regarding claims 15, 58, 75:

Schulz discloses the method of claim 1, wherein the saved results include cell delays, net delays, transition times, path reports, bottleneck reports, modes, slack, and constraints **('An Introduction Please' 2nd paragraph; 'A Look Under the Hood' 2nd, 5th-6th paragraphs; 'Putting Timing Analysis Tools to Work' 9th paragraph).**

Regarding claims 16, 59, 76:

Schulz discloses reporting the merged results including cell delays, net delays, transition times, path reports, bottleneck reports, modes, slack, and constraints **('An Introduction Please' 2nd paragraph; 'A Look Under the Hood' 2nd, 5th-6th paragraphs; 'Putting Timing Analysis Tools to Work' 9th paragraph).**

Regarding claims 17, 60, 77:

Schulz discloses allowing multiple modes and corners to be analyzed simultaneously **('Putting Timing Analysis Tools to Work' 7th paragraph).** The prior art discloses single-pass analysis of best/worst case conditions in order to minimize cycle time.

Regarding claims 18, 61, 78:

Schulz discloses modifying a predetermined set of parameters after completing an initial multi-mode/multi-corner analysis, and performing an analysis to provide a what-if capability **('More Bells and Whistles' 2nd paragraph).**

Regarding claim 19:

Schulz discloses a method of performing static timing analysis on a design, the method comprising:

a. performing multiple static timing analysis runs with the design, each run using a predetermined set of parameters, including a mode and corner **('A Look Under the Hood' 5th paragraph).** The prior art discloses tools that are capable of performing minimum/maximum delay analysis (i.e. multiple runs are needed, one to account for the minimum delay and a second to account for the maximum delay) and modal analysis.

b. saving results from the multiple static timing analysis runs **('A Look Under the Hood', 2nd paragraph).** Once the runs are completed, the data is collected and presented to the user in reports and various visualization tools.

Schulz does not explicitly disclose merging the results. **Schultz teaches** merging the results, wherein the desired information regarding a predetermined set of modes/corners can be merged before other information **(Schultz: [0025], [0026], [0028])**. At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Schulz and Schultz in order to minimize the number of probe pointes necessary to isolate a failure and eliminate manual tracking of schematic and waveforms during root cause debugging **(Schultz: [0011]).**

Regarding claim 21:

Schulz inherently discloses saving the results in a database. The prior art discloses compiling the results to produce a report **('A Look Under the Hood', 2nd paragraph)** and in order to this, the data would first be saved.

Regarding claim 22:

Schulz discloses forming a database that can be queried at different levels of detail **(2nd paragraph; 'Putting Timing Analysis Tools to Work' 9th-10th paragraphs).** The user can obtain

exhaustive timing analysis reports, reports that emphasize trouble areas, or waveform models of selected critical paths.

Regarding claim 23:

Schultz discloses the report of claim 20, wherein the set of automatically merged results is user specified **([0027]).**

Regarding claim 24:

Schultz discloses the report of claim 20, wherein the set of merged results is determined in advance of each run **(figure 1 step 210).**

Regarding claim 26:

Schulz discloses independent multiple static timing analysis runs **('A Look Under the Hood' 5th paragraph).** The prior art discloses tools that are capable of performing minimum/maximum delay analysis (i.e. multiple runs are needed, one to account for the minimum delay and a second to account for the maximum delay). Since the runs account for two different delays, they cannot share information and are thus independent.

Regarding claim 27:

Schulz discloses sharing information within the multiple static timing analysis runs **('A Look Under the Hood' 1st-2nd paragraphs).** The tool parses the netlist, maps it into a target library, and creates a list of paths. This list is then shared amongst the runs as they prune the paths according to their criteria, and then compute values for the cells and interconnects incorporating timing or parasitic data.

Regarding claim 28:

Schulz discloses performing the multiple static timing analysis runs in parallel **('Putting Timing Analysis Tools to Work' 7th paragraph).** The prior art discloses single-pass analysis of best/worst case conditions in order to minimize cycle time.

Regarding claim 29:

Schulz discloses performing the multiple static timing analysis runs in series **('More Bells and Whistles' 2nd paragraph).** The prior-art discloses what-if analysis, which allows for on-the-fly variations (i.e. multiple runs in series).

Regarding claim 30:

Schulz discloses forming a database that can be queried at different levels of detail **(2nd paragraph; 'Putting Timing Analysis Tools to Work' 9th-10th paragraphs).** The user can obtain exhaustive timing analysis reports, reports that emphasize trouble areas, or waveform models of selected critical paths.

Regarding claim 32:

Schulz discloses allowing multiple modes and corners to be analyzed simultaneously **('Putting Timing Analysis Tools to Work' 7th paragraph).** The prior art discloses single-pass analysis of best/worst case conditions in order to minimize cycle time.

Regarding claims 33 and 82:

Schulz discloses a computer-readable medium comprising instructions, that when executed by a processor, provide instructions for generating merged results from multiple static timing analysis runs, the instructions comprising,:

a. a first set of instructions for performing multiple static timing analysis runs with the design, each run using a predetermined set of parameters including a mode and corner **('A Look Under the Hood' 5th paragraph).** The prior art discloses tools that are capable of performing minimum/maximum delay analysis (i.e. multiple runs are needed, one to account for the minimum delay and a second to account for the maximum delay) and modal analysis.

b. a second set of instructions for saving results from the multiple static timing analysis runs **('A Look Under the Hood', 2nd paragraph).** Once the runs are completed, the data is collected and presented to the user in reports and various visualization tools.

Schulz does not explicitly disclose merging the results regarding the modes/corner. **Schultz teaches** merging the results **(Schultz: [0028]-[0029])**, according to modes/corners **(Schultz: figure 2 step 210)**, and including reporting parts of the design that are analyzed for each mode and corner **(Schultz: figures 7A-7D: nodes listed)**. At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Schulz and Schultz in order to minimize the number of probe pointes necessary to isolate a failure and eliminate manual tracking of schematic and waveforms during root cause debugging **(Schultz: [0011]).**

Regarding claim 34:

Schulz discloses a method of performing static timing analysis on a design, the method comprising:

a. performing multiple static timing analysis runs with the design, each run using a predetermined set of parameters including a mode and corner **('A Look Under the Hood' 5th paragraph).** The prior art discloses tools that are capable of performing minimum/maximum delay analysis (i.e. multiple runs are needed, one to account for the minimum delay and a second to account for the maximum delay) and modal analysis.

b. saving results from the multiple static timing analysis runs, and reading and reporting the results **('A Look Under the Hood', 2nd paragraph).** Once the runs are completed, the data is collected and presented to the user in reports and various visualization tools.

Schulz does not explicitly disclose results that provide analysis coverage and path information at multiple levels of detail. **Schultz teaches** merging the results to provide analysis coverage **(Schultz: [0029])** and path information at multiple levels of detail **(Schultz: [0026]).** At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Schulz and Schultz in order to minimize the number of probe pointes necessary to isolate a failure and eliminate manual tracking of schematic and waveforms during root cause debugging **(Schultz: [0011]).**

Regarding claim 35:

Schulz discloses forming a database that can be queried at different levels of detail **(2nd paragraph; 'Putting Timing Analysis Tools to Work' 9th-10th paragraphs).** The user can obtain exhaustive timing analysis reports, reports that emphasize trouble areas, or waveform models of selected critical paths.

Regarding claim 36:

Schulz discloses restoring (i.e. reading) the database and making additional queries (**'A Look Under the Hood' 2nd paragraph).** The reports and visualization tools can provide results sorted according to the user preferences (i.e. the user can query the database to access desired information).

Regarding claim 37:

Schulz discloses querying from one or more runs **('A Look Under the Hood' 2nd paragraph).** After the timing verifier engine calculates slack and constraint violations (two separate runs), the results of both runs are presented to the user.

Regarding claim 38:

Schulz discloses adding additional results to the saved results of each run during each query **('More Bells and Whistles' 2nd paragraph).**

Regarding claim 41:

Schulz discloses saving results of predetermined queries **('A Look Under the Hood' 2nd paragraph).** If the engine calculates slack and constraints violations, the reports containing this data are then presented to the user.

Regarding claim 42:

Schulz discloses saving cell delays, net delays, transition times, path reports, bottleneck reports, modes, slack, and constraints **('An Introduction Please' 2nd paragraph; 'A Look Under the Hood' 2nd, 5th-6th paragraphs; 'Putting Timing Analysis Tools to Work' 9th paragraph).**

Regarding claim 43:

Schulz discloses reporting the merged results including cell delays, net delays, transition times, path reports, bottleneck reports, modes, slack, and constraints **('An Introduction Please' 2nd paragraph; 'A Look Under the Hood' 2nd, 5th-6th paragraphs; 'Putting Timing Analysis Tools to Work' 9th paragraph).**

Conclusion

Examiner's Remarks: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP

KAMINI SHAH
SUPERVISORY PATENT EXAMINER